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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,374	11/30/2007	**Gianni Mochi**	0341-009	2576

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Potomac Patent Group PLLC
P.O. Box 270
Fredericksburg, VA 22404

EXAMINER	
PARK, HYUN D	
ART UNIT	**PAPER NUMBER**
2863	

NOTIFICATION DATE	DELIVERY MODE
01/22/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

tammy@ppglaw.com
gpo.mail@ge.com

Office Action Summary	Application No.	Applicant(s)	
	10/540,374	MOCHI ET AL.	
	Examiner	Art Unit	
	HYUN PARK	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 November 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/05/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Previous objection to the specification is withdrawn in view of the Applicant's amendment filed November 5, 2009.

Drawings

2. Previous objection to the drawing is withdrawn in view of the Applicant's amendment filed November 5, 2009.

Claim Objections

3. Previous objections are withdrawn in view of the Applicant's amendment filed November 5, 2009.

Claim Rejections - 35 USC § 112

4. Previous rejection under 35 USC 112, second paragraph is withdrawn in view of the Applicant's amendment filed November 5, 2009.

Claim Rejections - 35 USC § 101

5. Previous rejection is withdrawn in view of the Applicant's amendment filed November 5, 2009.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 3-4, 6-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US-PGPUB 2002/0134083 (hereinafter Staphanos) (cited by the applicant) in view of Keeler et al, US Pat No. 5,386,373 (hereinafter Keeler).

Regarding Claim 1: Staphanos discloses a CEM (Continuous Emission Monitoring) method for estimation and control of the concentrations of pollutant gases (*Paragraph [0026], lines 6-14*) at the discharge of a gas turbine (*Paragraph [0051], line 9*), comprising the following steps:

receiving a plurality of signals (*signal related to sample gas flow (Paragraph [0036], lines 15-16; signal related to oxygen concentration (Paragraph [0036], lines 19-20; signal related to carbon dioxide Paragraph [0036], lines 22-24; signal related to nitrogen oxide Paragraph [0036], lines 24-28; as well as numerous inputs from the engine*

(Paragraph [0037], lines 4-5) corresponding to data relating to the operating state of the turbine (*Paragraph [0026], lines 9-14*);

processing in a processor of this data (*Paragraph [0039], lines 9-19; Paragraph [0040], lines 1-4*);

and evaluating emissions into the atmosphere from the turbine on the based on the processed data (*Paragraph [0039], lines 16-19*).

Staphanos does not disclose an operating state of the gas turbine, wherein the data includes a rotation speed of a shaft, a temperature of a discharge at the gas turbine, and a temperature of the environment. Furthermore, Staphanos does not disclose evaluating emission into the atmosphere from the gas turbine based on the processed data without using in-line analyzers.

Keeler discloses a well known predictive emission monitoring system which uses a virtual sensor network that models the emission producing process that generates the output emission and predicts the quantity of output emissions that are produced given the operating state of the source of emissions (*Abstract Fig. 1*). In this disclosure, the pollutant sensor (or the analyzer) is required only for the initial model training of virtual sensor network, wherein afterwards, it is removed and the said virtual network operates by solely evaluating emissions during normal operation based on the inputted control

and sensor values that are not related to in-line analyzers (*Col. 3, lines 50-68; Col. 4, lines 45; Col. 8, lines 42-68; Col. 9, lines 1-18*).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Keeler and Staphanos and use the efficient and cost-effective predictive emission monitoring that does not use the in-line analyzer to monitor the gas turbine instead of the CEM, since the said analyzers are very expensive, difficult to maintain and properly calibrated (Col. 1, lines 45-68), as taught by Keeler. Furthermore, although Keeler discloses monitoring the boiler (*Col. 8, lines 42-68; Col. 9, lines 1-18*) and not gas turbine, it would have been obvious to a person of ordinary skill in the art to monitor the gas turbine, since it is the source of emissions, and monitoring allows the effect of various factors influencing the emission to be readily observed and evaluated. Finally, although Staphanos discloses the input signals from the engine *Paragraph [0037], lines 4-5)*, and does not explicitly disclose the signals related to an operating state of the gas turbine, namely the rotation speed of a shaft, temperature of a discharge at the gas turbine, and a temperature of the environment, it would have been obvious to a person of ordinary skill in the art to use the said signals, since they are well known gas turbine operating parameters that influences the emission property.

Regarding Claim 3. Keeler discloses processing using known parameters and constant of the boiler to evaluate emissions (*Col. 8, lines 42-68; Col. 9, lines 1-18).* Although the modified method of Keeler does not disclose processing using known

parameters and constants of the gas turbine to evaluate the emissions, it would have been obvious to a person of ordinary skill in the art to use the said parameters and constant of the gas turbine, since they are well known gas turbine operating parameters that influences the emission property.

Regarding Claim 4: Staphanos discloses a CEM (Continuous Emission Monitoring) system for estimation and control of the concentrations of pollutant gases at the discharge of a gas turbine, comprising:

an acquisition unit (3) (*CPU **212**; Fig. 4*) configured to receive data relating to an operating state of the gas turbine, (*Paragraph [0039], lines 9-19*)

the data being detected by a control panel (2) of the gas turbine (*emission monitoring system **120**; Fig. 5*); (*Emission monitoring system receives data pertaining to emissions as well as engine data as described in the Paragraph [0045])*

and a local processing unit (*display **226**; Fig. 4*) connected to the acquisition unit and configured to process the data in association with the acquisition unit and to make the data available at a remote location (*Paragraph [0038], lines10-12*), in order to evaluate the emissions by the turbine into the atmosphere, based on the data processed (*Paragraph [0039], lines 16-19*).

Staphanos does not disclose an operating state of the gas turbine, wherein the data includes a rotation speed of a shaft, a temperature of a discharge at the gas turbine, and a temperature of the environment. Furthermore, Staphanos does not disclose evaluating emission into the atmosphere from the gas turbine based on the processed data without using in-line analyzers.

Keeler discloses a well known predictive emission monitoring system which uses a virtual sensor network that models the emission producing process that generates the output emission and predicts the quantity of output emissions that are produced given the operating state of the source of emissions (*Abstract Fig. 1*). In this disclosure, the pollutant sensor (or the analyzer) is required only for the initial model training of virtual sensor network, wherein afterwards, it is removed and the said virtual network operates by solely evaluating emissions during normal operation based on the inputted control and sensor values that are not related to in-line analyzers (*Col. 3, lines 50-68; Col. 4, lines 45; Col. 8, lines 42-68; Col. 9, lines 1-18*).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Keeler and Staphanos and use the efficient and cost-effective predictive emission monitoring that does not use the in-line analyzer to monitor the gas turbine instead of the CEM, since the said analyzers are very expensive, difficult to maintain and properly calibrated (*Col. 1, lines 45-68*), as taught by Keeler. Furthermore, although Keeler discloses monitoring the boiler (*Col. 8, lines 42-68; Col. 9, lines 1-18*)

and not gas turbine, it would have been obvious to a person of ordinary skill in the art to monitor the gas turbine, since it is the source of emissions, and monitoring allows the effect of various factors influencing the emission to be readily observed and evaluated. Finally, although Staphanos discloses the data from the engine (*Paragraph [0037], lines 4-5)* and does not explicitly disclose the data related to an operating state of the gas turbine, namely the rotation speed of a shaft, temperature of a discharge at the gas turbine, and a temperature of the environment, it would have been obvious to a person of ordinary skill in the art to use the said data, since they are well known gas turbine operating parameters that influences the emission property.

Regarding Claims 6, 7: Staphanos discloses a system, comprising a remote processing unit (*monitor and control node **308**;* Fig. 6) which is connected to the local processing unit (*or local controllers **306,** in the form of CPU 212; Fig. 6; Paragraph [0051], lines 21-24))* by telecommunications line (*Internet is a telecommunication line; Paragraph [0051], lines 1-4)*

Regarding Claim 8: Staphanos discloses a system, wherein the remote unit is configured to access the data via an Internet consultation program (*or suitable software as described in the Paragraph [0047], lines 1-8)*

Regarding Claim 9: Staphanos discloses a system, wherein the local processing unit (*or local controller in the form of CPU **212** (Fig. 4); Paragraph [0051], lines 21-24*)

comprises a calculator which carries out the processing of the data (*Paragraph [0038], lines 9-13*)

Regarding Claim 10: Staphanos discloses a system wherein the calculator carries out statistical calculation of the data stored in the historic data base for operation of the gas turbine. (Paragraph [0039], lines 13-15 states that other optimization technique can be used. One of the well known optimization technique that is based on statistic is the *Statistical Optimization)*.

Regarding Claim 11, 13. Staphanos discloses the local processing unit is configured to determine emissions of oxygen, nitric oxides, and carbon monoxide of the gas turbine (*Paragraph [0028])*.

Regarding Claim 12, 14. Staphanos discloses the input data from the engine (*Paragraph [0037], lines 4-5)*, and although the modified method and system of Staphanos does not explicitly disclose the data related to an operating state of the gas turbine, namely the temperature at a discharge from a compressor of the gas turbine, a pressure of delivery to the compressor, a relative humidity of the environment, a molecular weight of a combustible gas, a compressibility of the combustible gas, a delivery mass of fuel, and a delivery of the combustion air, it would have been obvious to a person of ordinary skill in the art to use the said data, since they are well known gas turbine operating parameters that influences the emission property

9. Claims 2, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staphanos, US-PGPUB 2002/0134083 in view of Keeler et al, US Pat No. 5,386,373 , as applied to claims 1, 4 above and in further view of Fasca US-PGPUB, 2003/0065581 (hereinafter Fasca).

Regarding Claims 2, 5. The modified method and system of Staphanos does not disclose storing the data processed in order to create a historic file of the emissions from the gas turbine.

Fasca discloses storing and reviewing historical data to perform forecasting simulations related to pollutant emission, so as to obtain the optimal pollution control strategy (*Abstract; Paragraph [0020]).*

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teachings of Fasca in the modified pollution monitoring method and system of Staphanos to store the data processed in order to create a historic file of the emissions from the gas turbine, so as perform simulation and obtain the optimal pollution control strategy, as taught by Fasca.

Response to Arguments

10. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Visser et al., "Modeling the effects of operations conditions and alternative fuels on gas turbine performance and emissions," **discloses various parameters that influence the emission in gas** turbine (1998).

Environment Protection Agency report, "Predictive emission monitoring system to determine NOx and CO emission from an industrial furnace," **discloses various parameters that influence the emission in gas turbine.** (1997)

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HYUN PARK whose telephone number is (571)270-7922. The examiner can normally be reached on 8-4 PM, M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571)272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. P./
01/15/2010

Drew A. Dunn
/Drew A. Dunn/
Supervisory Patent Examiner, Art Unit 2863